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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/043,376 | 01/09/2002 | Henryk Birecki | 10004241-1 | 6334 |

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

| EXAMINER |
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WILLIAMS, JOSEPH L

| ART UNIT | PAPER NUMBER |
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2879

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,376

Applicant(s)

BIRECKI ET AL.

Examiner

Joseph L. Williams

Art Unit

2879



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 23-29 is/are pending in the application.
- 4a) Of the above claim(s) 2,8 and 302 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 23-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1/9/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 14-22 and 30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 27 May 2004.

Applicant's election with traverse of claims 1-7 and 23-29 in the reply filed on 27 May 2004 is acknowledged. The traversal is on the ground(s) that the search would not be a serious burden upon the Examiner. This is not found persuasive because the method of making an electron emitter has achieved a separate status in the art.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections – 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2879

Claims 1, 3-5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by van Gorkom et al. (US 4,370,797).

Regarding claim 1, van Gorkom ('797) teaches in figure 2 and in column 7, line 15 through column 9, line 30, a planar electron emitter device (1), the planar electron emitter device comprising: an emitter electrode (31); an extractor electrode (9); and a solid-state field controlled electron emitter (10) having a Schottky metal-semiconductor junction fabricated on the emitter electrode (31) and electrically coupled to the extractor electrode such that an electric potential placed between the emitter electrode and the extractor electrode results in field emission of electrons from an exposed surface of the Schottky metal-semiconductor junction, wherein the semiconductor layer of the Schottky metal-semiconductor junction includes an outer perimeter that is thicker in depth (see around number 14) than at an interior portion of the semiconductor layer thereby reducing electron beam emission at the outer perimeter wherein an electric field applied between the emitter electrode and the extractor electrode draws emission electrons from the surface of the planar electron emitter towards the extractor electrode at a higher rate at the interior portion than at the outer perimeter.

Regarding claim 3, van Gorkom ('797) teaches the planar electron emitter has a generally concave top surface.

Art Unit: 2879

Regarding claim 4, van Gorkom ('797) teaches the planar electron emitter comprises a metal first layer and a semiconductor second layer deposited on the first metal layer.

Regarding claim 5, van Gorkom ('797) teaches a dielectric layer (7) placed between the emitter electrode and the extracting electrode.

Regarding claim 7, van Gorkom ('797) teaches the semiconductor layer second layer comprises a wide band-gap semiconductor.

Claims 23, 24, 27, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Gray (US 5,266,155).

Regarding claim 23, Gray ('155) teaches in figure 11 a planar field emission electron emitter device, the field emission electron emitter device comprising: an emitter electrode (22); an extractor electrode (26); and a planar electron emitter (14), electrically coupled to the emitter electrode and the extractor electrode to provide an electric field to draw emission electrons from the surface of the planar electron emitter wherein the planar electron emitter is configured to bias electron emission in a central region in preference to an outer region.

Regarding claim 24, Gray ('155) teaches a focusing electrode (29) electrically coupled to the planar electron emitter.

Regarding claim 27, Gray ('155) teaches a dielectric layer (24) placed between the emitter electrode and the extracting electrode.

Regarding claim 28, Gray ('155) teaches a second dielectric (28) placed between the extracting electrode and the focusing electrode.

Claim Rejections – 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Gorkom et al. (US 4,370,797) in view of Christensen (US 4,498,952).

Regarding claim 2, van Gorkom ('797) teaches all of the claimed limitations except for the focusing electrode electrically coupled to the planar electron emitter.

Further regarding claim 2, Christensen ('952) teaches in figure 17, a focusing electrode (14) for the purpose of improving the electron flow and thus improve the efficiency of the display.

Hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the focusing electrode of Christensen in the

Art Unit: 2879

emitter device of van Gorkom for the purpose of improving the electron flow and thus improve the efficiency of the display.

Regarding claim 6, Christensen ('952) teaches a second dielectric (19) placed between the extracting electrode and the focusing electrode.

The reason for combining is the same as for claim 2 above.

Claims 25, 26, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray (US 5,266,155) in view of van Gorkom et al. (US 4,370,797)

Regarding claim 25, Gray ('155) teaches all of the claimed limitations except for the planar electron emitter having a generally concave top surface.

Further regarding claim 25, van Gorkom ('797) teaches in figure 2 that the planar electron emitter has a generally concave top surface for the purpose of improving the electron flow of the display.

Hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the planar electron of Gorkom in the device of Gray for the purpose of improving the electron flow of the display.

Regarding claim 26, van Gorkom ('797) teaches the planar electron emitter comprises a metal first layer and a semiconductor second layer deposited

Art Unit: 2879

on the first metal layer, the semiconductor layer having a generally concaved top surface.

The reason for combining is the same as for claim 25 above.

Regarding claim 29, van Gorkom ('797) teaches the semiconductor layer second layer comprises a wide band-gap semiconductor.

The reason for combining is the same as for claim 25 above.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kurokawa et al. (US 6,645,402) discloses the state of the art for a semiconductive FED.


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph L. Williams whose telephone number is (571) 272-2465. The examiner can normally be reached on M-F (6:30 AM-3:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2879

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph L. Williams
Primary Examiner
Art Unit 2879